REMARKS

Claims 1 to 42, as amended, appear in this application for the Examiner's review and consideration. Claims 27 to 42 are withdrawn from consideration, as being drawn to a non-elected invention. The amendments to the claims are fully supported by the specification and claims as originally filed. In particular, the recitations in the amended claims of the sample chamber optionally comprising two or more compartments, connected by one or more channels that allow a fluid medium to flow freely between the compartments are supported by paragraph [0036] of the present specification, and the recitations of the sample chamber having a depth greater than that of the microfluidic channel are supported by the drawings of the specification. Therefore, there is no issue of new matter.

At page 2, the Office Action states "the electric field lines shown in figures 5, 9B, 10, 11 and 12 do not match the expected field lines for the parallel bar electrodes used within the figures to create the electric field."

In response, Applicants submit that the subject figures are intended to show the effect of the electric field in the sample chamber on molecules in the chamber generally. The brief description of each of those figures in the specification states that the arrows at the ends of the field lines indicate the direction of migration of DNA, not the electric field direction. Specification, Paragraphs [0019], and [0023] to [0026]. In addition, the drawings are not intended to particularly illustrate parallel bar electrodes or the field lines generated by such parallel electrodes, as the invention is not restricted to such electrodes. Non-parallel electrodes are within the scope of the claimed invention, as illustrated in Fig. 15. Illustrating the electrodes as parallel was simply a convenient way of illustrating the electrodes. Similarly, the field lines were simply drawn in a convenient way to show the affect of the field on molecules in the sample chamber. One of ordinary skill in the art would understand that the filed lines illustrated in figures 5, 9B, 10, 11, and 12 are not intended to match the expected field lines that result from the application of a voltage to parallel bar electrodes.

Claims 1 to 7, 9, 10, 13, 15 to 17, 19 to 22 and 24 were rejected under 35 U.S.C. §102(b), as allegedly being anticipated by U.S. patent No. 6,214,191 to Wiktorowicz et al. (Wiktorowicz) for the reasons set forth on pages 2 to 4 of the Office Action; claims 8, 11, 12, 14, 18, 23, 25 and 26 were rejected under 35 U.S.C. §103(a), as allegedly being unpatentable over Wiktorowicz in view of U.S. Patent No. 4,959,133 to Adcock for the reasons set forth on pages 5 and 6 of the Office Action; and claims 11, 12, 25 and 26 were rejected under 35 U.S.C. §103(a), as allegedly being obvious over Wiktorowicz in view of U.S. Patent No. 6,162,602 to Gautsch for the reasons set forth on pages 6 and 7 of the Office Action.

In response, Applicants submit that the presently claimed invention, as recited in claim 1, is directed to an integrated microfluidic device comprising a sample chamber and a fluid reservoir connected by a microfluidic channel. The microfluidic channel comprises an inlet and an outlet. The sample chamber has a depth greater than that of the microfluidic channel, is positioned at the inlet of the microfluidic channel, and comprises a first electrode and a second electrode, capable of generating a first electric field in the sample chamber, where the first electric field is configured to transfer charged molecules in the sample chamber to the inlet of the microfluidic channel. The sample chamber optionally comprises two or more compartments, connected by one or more channels that allow a fluid medium to flow freely between the compartments. The fluid reservoir is positioned at the outlet of the microfluidic channel, and comprises a third electrode capable of generating a second electric field with at least the second electrode. Applicants note that the use of the term "optionally" in a claim is discussed in M.P.E.P. §2173.05(h)(III). In the present case, the use of the term "optionally" in the claims does not result in any ambiguity as to which alternatives are covered by the claim.

Independent claim 5 differs from claim 1 in that claim 5 recites that the sample chamber comprises a section of matrix material comprising charged molecules, which are electro-eluted from the matrix material by the first electric field.

Independent claim 15 differs from claim 1 in that claim 15 recites that the sample chamber is positioned at the outlet of the microfluidic channel.

Independent claim 20 differs from claim 15 in that claim 20 recites that the sample chamber comprises a section of matrix material, and the first electric field is configures to transfer charged molecules from the outlet of the microfluidic channel into the section of matrix material.

As defined in the present specification, a "sample chamber" is a well, reservoir, or cavity that contains a fluid medium. Paragraph [0036]. A sample chamber may comprise two or more compartments, inter-connected by one or more channels, where the inter-connected chambers form a single sample chamber when a fluid medium can flow freely between the compartments. Paragraph [0036] and Fig. 7. As will be understood by one of ordinary skill in the art, the dictionary definition of the term "freely" is without hindrance, restriction, or interference, and a fluid can flow freely when not subjected to any appreciable hindrance, restriction, or interference. A fluid that can flow freely is capable of relatively unrestricted motion. Therefore, any channel between compartments in a sample

reservoir of the presently claimed device must allow the fluid medium to flow freely between the compartments.

As will also be recognized by those skilled in the art, separation channels, such as electrophoretic channels, do not allow the free flow of a fluid medium. Instead, separation channels are intended to partially restrict the flow of a fluid medium to provide the desired separation of molecular or particulate materials in the fluid medium. If the fluid medium is allowed to flow freely through the separation channel, no separation will occur.

In contrast to the presently claimed invention, Wiktorowicz discloses electrophoretic transport channel 180, column 7, lines 25 to 29, and separation channels 170, column 6, lines 52 and 53, and column 7, lines 1 to 4. Therefore, channels 170 and 180 do not provide a free flow of a fluid medium between compartments, and, thus, do not connect chambers of a sample chamber, as presently claimed. Accordingly, Wiktorowicz does not disclose the sample chamber comprising first and second electrodes of the presently claimed invention.

Moreover, Wiktorowicz also discloses that the depth of channels 170 and 180 and regions 126 and 160 are all preferably the same. Column 7, lines 8 to 14, and column 8, lines 6 to 29. One of ordinary skill in the art would understand that, although absolute dimensions may vary, Wiktorowicz discloses that the depth of all portions of the disclosed device should be of the same depth. Therefore, Wiktorowicz does not disclose a sample chamber having a depth greater than that of the microfluidic channel, as presently claimed.

Adcock does nothing to overcome the deficiencies of Wiktorowicz. Adcock discloses means and a method for electroblotting or electroelution, where a field is inverted repeatedly over time, until an electrophoretically separated DNA, RNA, or protein is forced out of the gel and to an appropriate receiver by the net field so produced. Adcock, abstract. Adcock does not disclose or suggest a sample chamber that comprises a first electrode and a second electrode capable of generating a first electric field in the sample chamber, where the first electric field is configured to transfer charged molecules in the sample chamber to the inlet of the microfluidic channel, as presently claimed. Even if the disclosure of Adcock was combined with that of Wiktorowicz, the resulting combinations would not provide the presently claimed invention. Instead, the combination would provide chambers separated by separation channels, where an inverted field was applied to an electrode in each of the chambers.

Gautsch does nothing to overcome the deficiencies of Wiktorowicz. Gautsch discloses an apparatus and method for nucleic acid base sequencing in which gel electrophoresis employing agarose or polyacrylamide gels is used to separate fragments.

Gautsch, column 3, lines 12 to 17. Gautsch does not disclose or suggest a sample chamber that comprises a first electrode and a second electrode capable of generating a first electric field in the sample chamber, where the first electric field is configured to transfer charged molecules in the sample chamber to the inlet of the microfluidic channel, as presently claimed, as recited in claims 1 and 5, or to transfer charged molecules from the outlet of the microfluidic channel into the sample chamber, as recited in claims 15 and 20. Even if the disclosure of Gautsch was combined with that of Wiktorowicz, the resulting combination would not provide the presently claimed invention. Instead, the combination would provide the combination would provide chambers separated by separation channels, having an electrode in each of the chambers and an agarose or polyacrylamide gel in one of the chambers.

Therefore, Wiktorowicz, Adcock, and Gautsch, whether taken alone or in combination, do not disclose or suggest the present invention, and, thus, the present claims are not anticipated by or obvious over those references. Accordingly, it is respectfully requested that the examiner withdraw the rejections of claims 1 to 7, 9, 10, 13, 15 to 17, 19 to 22 and 24 under 35 U.S.C. §102(b) over Wiktorowicz, claims 8, 11, 12, 14, 18, 23, 25 and 26 under 35 U.S.C. §103(a) over Wiktorowicz in view of Adcock, and claims 11, 12, 25 and 26 under 35 U.S.C. §103(a) over Wiktorowicz in view Gautsch.

Claims 15 to 19 were rejected under 35 U.S.C. §102(e), as allegedly being anticipated by U.S. Patent No. 6,361,671 to Mathies et al. (Mathies) for the reasons set forth on pages 4 and 5 of the Office Action.

In response, Applicants reserve the right to antedate Mathies with a Rule 131 Declaration. In addition, Applicants submit, as discussed above, that the present claims require a sample chamber having a depth greater than that of the microfluidic channel.

In contrast, Mathies discloses a device that includes a separation channel 12 and a detection reservoir 13. The separation channel widens into the detection reservoir, which is 10 to 100 times wider than the channel. Mathies does not disclose a sample chamber having a depth greater than that of the microfluidic channel.

Therefore, as Mathies does not disclose a sample chamber having a depth greater than that of the microfluidic channel, the present claims are not anticipated by that reference. Accordingly, it is respectfully requested that the Examiner withdraw the rejection of claims 15 to 19 under 35 U.S.C. §102(e) over Mathies.

Applicants thus submit that the entire application is now in condition for allowance, an early notice of which would be appreciated. Should the Examiner not agree with

Applicants' position, a personal or telephonic interview is respectfully requested to discuss any remaining issues prior to the issuance of a further Office Action, and to expedite the allowance of the application.

A separate Petition for Extension of Time is submitted herewith. Should any other fees be due, however, please charge such fees to Deposit Account No. 11-0600.

Respectfully submitted,

KENYON & KENYON

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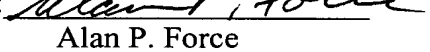
By: 

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